

Figure S1 **Fiber length distribution.** Short and long fiber lengths as measured by light microscopy showed a long tail on the linear scale (A) and a normal distribution on the logarithmic scale (B), characteristic of a log-normal distribution of fiber lengths.

| | Short fibers | Long fibers |
|---|-------------------------------|--------------------------------|
| Geometric Mean μ (Physical Length) | 1.946 (7.0 μm) | 3.671 (39.3 μm) |
| Geometric Standard Deviation, σ | 0.971 | 0.739 |

Table S1. **Fiber distribution parameters.** The length distribution of short and long fibers is represented by a log-normal distribution. The fitted mean and standard deviation parameters of the distribution are shown in the table. For both cases the distribution of the residuals was unbiased ($R^2 < 0.0006$).

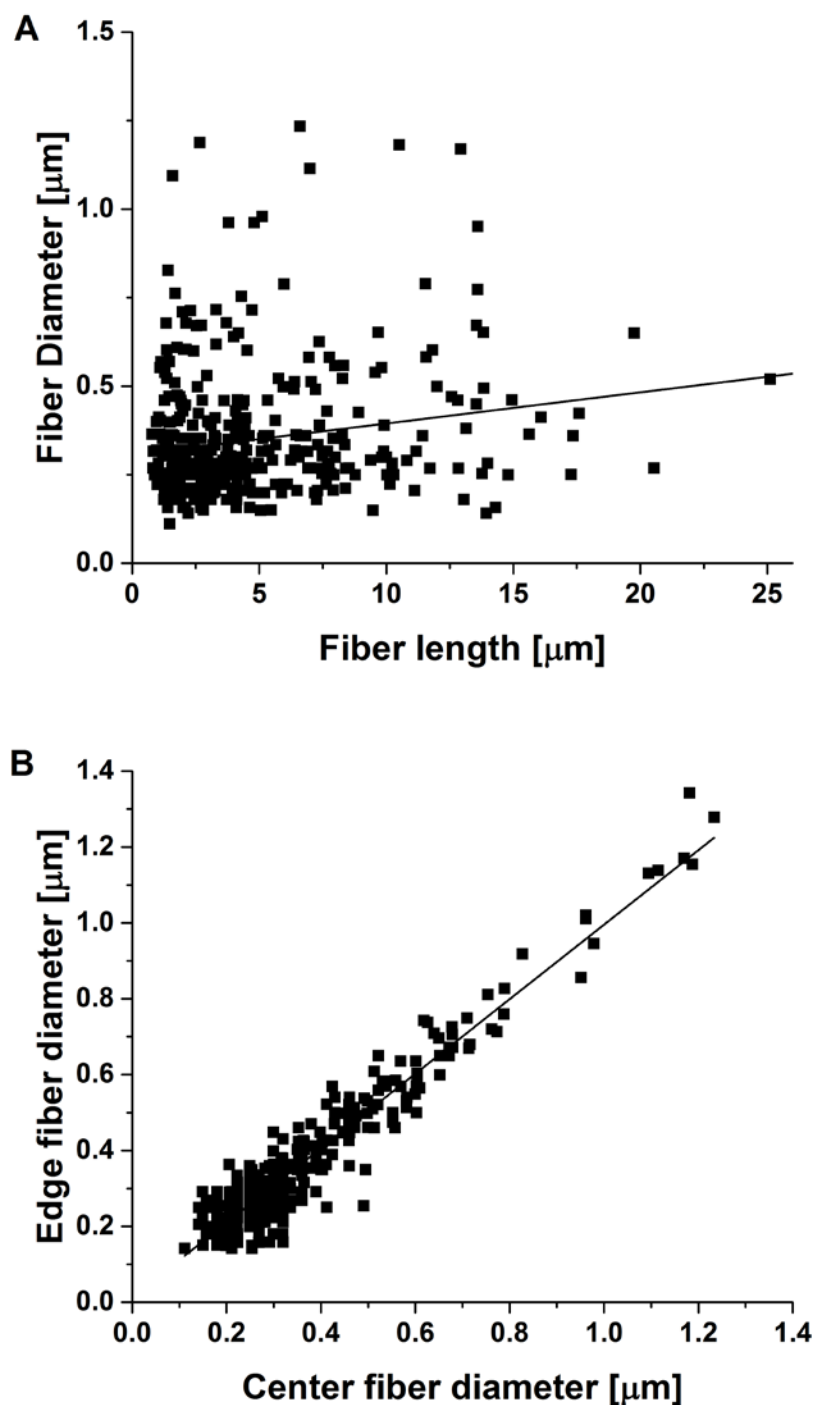


Figure S2. **Correlation of fiber diameter and length.** Fiber lengths and diameter were measured by electron microscopy at 4000 X. There was no correlation ($R^2 = 0.037$) between fiber diameter (center) and fiber length (A). Fiber diameters were measured at the midpoint, $\frac{1}{4}$ of the distance from either end, with all three diameters being highly correlated ($R^2 = 0.908$) (B) Thus, on any given fiber, the diameter is quite uniform; however different fibers have different diameters, and the length is uncorrelated to that diameter.

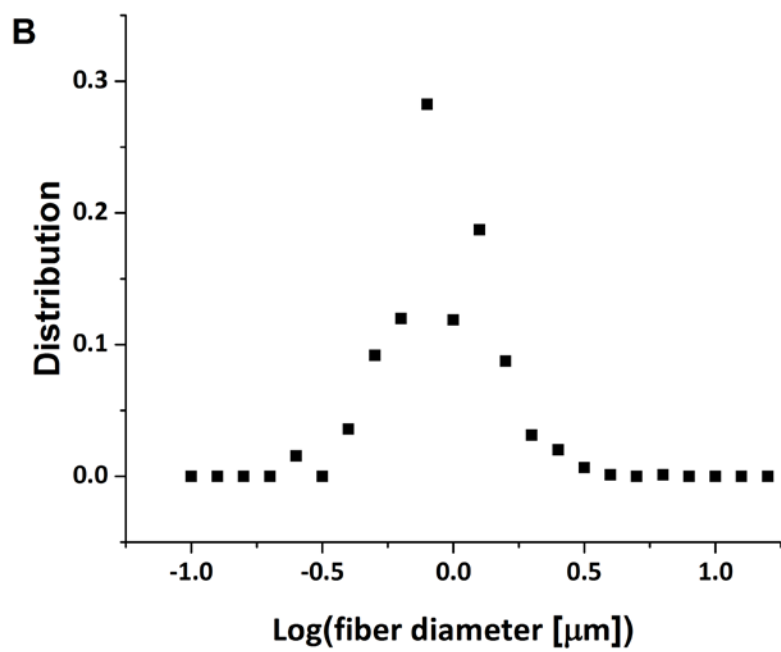
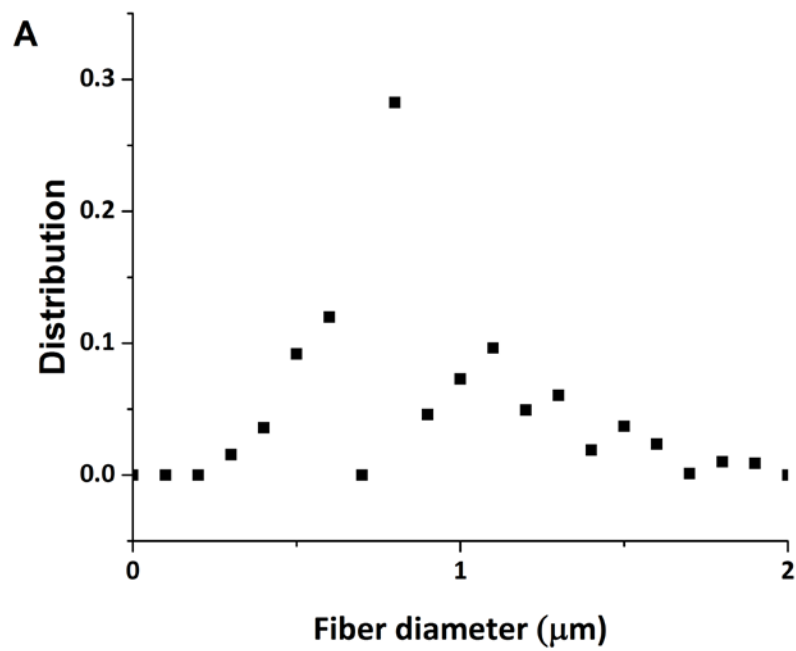


Figure S3 **Fiber diameter distribution.** Fiber diameters were measured by scanning electron microscope 4000 X. Center diameter fiber distribution on a (A) linear scale and (B) logarithmic scale.

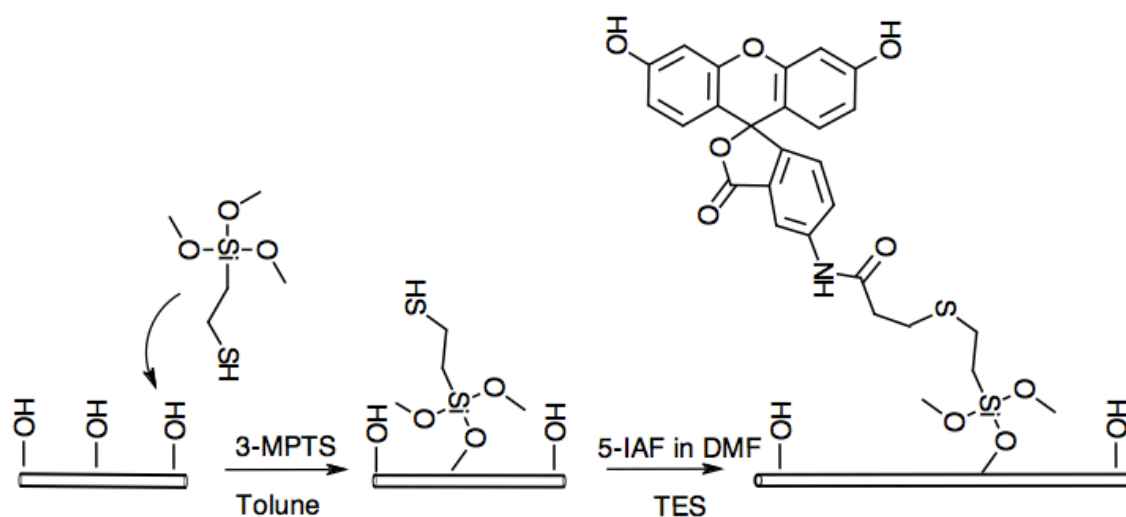


Figure S4. **Fluorescent Coupling Scheme.** Glass fibers are functionalized via a thiol-silanization reaction. Fluorescent probe, 5-iodoacetamidofluorescein (5-IAF) is then covalently conjugated to the glass fiber by undergoing a halogen mediated nucleophilic substitution with the surface bound thiols.

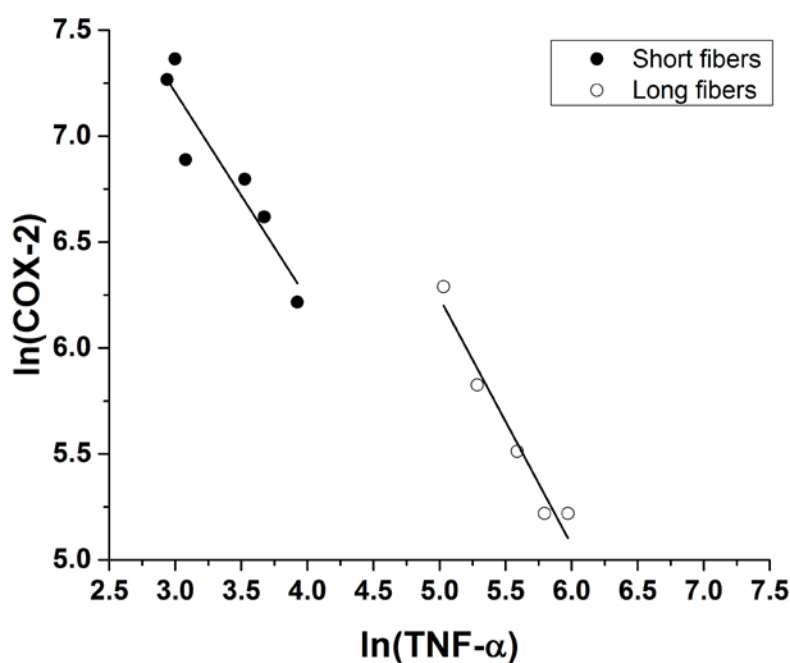


Figure S5. **COX-2 varies inversely with TNF- α .** COX-2 production decreased with respect to fiber length and dosage. COX-2 production varied inversely with TNF- α secretion.